



November 15, 2010

Dr. Rajendra Raja
Fermilab
MS. 122 (WH 9E)

Dear Raja,

Thank you for the revised proposal for an upgrade of the MIPP detector for a new experiment (P-960). We also appreciate your presentation at the recent Fermilab Physics Advisory Committee (PAC) meeting and responses to the questions asked by the PAC. The Committee remains concerned about the slow pace of results from the MIPP-I data and also about the complexity of the proposed new effort, given the strength of the existing collaboration. The full text of the PAC recommendation is attached.

As you see, the PAC recommends against approval of the proposal, and that the collaboration focus on completing the ambitious program of publications you outlined instead of working toward a new effort. I accept the recommendation about MIPP-II from the PAC, and formally reject P-960. While the possibility of making measurements with an upgraded detector could be appealing, I do not see a way to make this happen.

As you are aware, the Laboratory has provided additional help to MIPP to aid in getting results to publication. We will continue to do this for the near term. I wish you and your collaborators luck in completing the interesting program of MIPP-I measurements.

Sincerely,



Piermaria Oddone

cc:

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Excerpt from Physics Advisory Committee Comments and Recommendations, November 2010

MIPP-II (P-960)

The Main Injector Particle Production (MIPP-I) experiment (E-907) was approved in 2001. During the data-taking period in 2005-2006, MIPP-I accumulated a data sample of 18M hadroproduction events with various particle beams and targets. The analysis of this data set resulted in five Ph.D. theses over the years, as well as two papers, of which one has been submitted recently for publication and the other is in preparation.

The proposed MIPP-II upgrade is geared towards increasing the data rate from 20 Hz to 3 kHz, which would result in a capability of recording 5M events/day. MIPP-II would require an upgrade of the data-acquisition system that takes advantage of the electronics developed for the ALICE experiment at CERN, as well as other substantial improvements and additions. The upgraded detector would take data using six different beams on over 30 target nuclei. This represents a more comprehensive program than that of MIPP-I, as well as those of the HARP and NA61 experiments at CERN.

The Committee recognizes that the output of this experiment would be of use to a wide physics community. In particular, Monte Carlo generators (GEANT4, MARS, etc.) would benefit from improved precision in the hadroproduction measurements. The collaboration aims to create a library of events that would be available to the entire physics community, and could be used to tune shower generators. In addition, this data would be helpful to neutrino experiments to normalize the neutrino flux coming from their targets.

Unfortunately, the experimental apparatus needed to achieve the physics goals is very complex, mainly due to use of several devices needed for particle identification in a wide kinematic range and the non-trivial effects due to the magnetic field of the experiment. While the MIPP Collaboration has made some progress in increasing the number of collaborating institutions over the years, the Committee believes that it is still not strong enough to deal with the complexity of the detector and to successfully and expeditiously complete the analysis of the data.

The Committee was presented with an ambitious list of physics publications in progress that the Collaboration plans to publish in the next year and beyond. In October 2006 the PAC reviewed the proposal for the MIPP upgrade and recommended deferring its consideration until *“the Collaboration [has demonstrated] that the existing data can provide high-quality physics results with substantial impact.”* Since then, only one analysis has been submitted for publication. Thus, the Committee is particularly concerned about the Collaboration’s capability to perform a timely data analysis. The Committee recommends that the Collaboration concentrate on completing the analysis of existing data. The Committee suggests that this goal could be achieved through an increased involvement of the neutrino community at Fermilab in the MIPP-I data analysis.

Although the Committee recognizes the usefulness of the proposed measurements, these measurements are of lower priority compared to the other efforts at the Laboratory. Given the high level of sustained effort needed for a successful MIPP-II research program, the Committee recommends against approval of the MIPP-II proposal under both funding scenarios in the charge.